DTP T USW 233
Three Input Switcher with Integrated DTP Transmitter
Safety Instructions

WARNING: This symbol, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product’s enclosure that may present a risk of electric shock.

ATTENTION: This symbol, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.


Sicherheitsanweisungen • Deutsch

WARNUNG: Dieses Symbol auf dem Produkt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

VORSICHT: Dieses Symbol auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.


Instrucciones de seguridad • Español

ADVERTENCIA: Este símbolo, cuando se utiliza en el producto, avisa al usuario de la presencia de voltaje peligroso sin aislar dentro del producto, lo que puede representar un riesgo de descarga eléctrica.

ATENCIÓN: Este símbolo, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.


Instructions de sécurité • Français

AVERTISSEMENT : Ce pictogramme, lorsque utilisé sur le produit, signale à l’utilisateur la présence à l’intérieur de l’enceinte du produit d’une tension électrique dangereuse susceptible de provoquer un choc électrique.

ATTENTION : Ce pictogramme, lorsque utilisé sur le produit, signale à l’utilisateur des instructions d’utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l’accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, www.extron.com.

Istruzioni di sicurezza • Italiano

AVVERTENZA: Il simbolo, se usato sul prodotto, serve ad avvertire l’utente della presenza di tensione non isolata pericolosa all’interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

ATTENTZIONE: Il simbolo, se usato sul prodotto, serve ad avvertire l’utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l’apparecchio.


Instrukcje bezpieczeństwa • Polska

OSTRZEŻENIE: Ten symbol, gdy używany na produkcie, ma na celu poinformować podróżnika o istnieniu niewyisładowanego i niebezpiecznego napięcia wewnątrz obudowy produktu, który może stanowić zagrożenie porażenia prądem elektrycznym.

UWAGI: Ten symbol, gdy używany na produkcie, jest przeznaczony do ostrzegania podróżnika ważne opcjonalne oraz instrukcje konserwacji (obsługę) w literaturze, wyposażone w sprzęcie.


Инструкция по технике безопасности • Русский

ПРЕДУПРЕЖДЕНИЕ: Данный символ, если указан на продукте, предупреждает пользователя о наличии незаземленного опасного напряжения внутри корпуса продукта, которое может привести к поражению электрическим током.

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Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдении нормативных требований Extron на сайте Extron: www.extron.com, номер по каталогу - 68-290-01.

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有關安全性指導方針、法規遵守、EMI/EMF 標準性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站：www.extron.com，然後參閱《Extron 安全性與法規遵守手冊》，準編號 68-290-01。

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安全上の注意、法規厳守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト www.extron.com より「Extron Safety and Regulatory Compliance Guide」（P/N 68-290-01）をご覧ください。

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FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

ATTENTION: The Twisted Pair Extension technology works with shielded twisted pair (STP) cables only. To ensure FCC Class A and CE compliance, STP cables and STP Connectors are also required.

For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the “Extron Safety and Regulatory Compliance Guide” on the Extron website.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

| CAUTION: | Risk of minor personal injury. |
| ATTENTION: | Risque de blessure mineure. |

| ATTENTION: |
| • Risk of property damage. |
| • Risque de dommages matériels. |

| NOTE: | A note draws attention to important information. |
| TIP: | A tip provides a suggestion to make working with the application easier. |
Software Commands

Commands are written in the fonts shown here:

^AR Merge Scene,,0p1 scene 1,1 ^B 51 ^W^C
[01] R0004 0030 0040 0050 0060 0 02 35 [17] [03]

EXC [X1] *X15* [X20] *X23* [X21] CE ←

**NOTE:** For commands and examples of computer or device responses mentioned in this guide, the character “0” is used for the number zero and “O” is the capital letter “o.”

Computer responses and directory paths that do not have variables are written in the font shown here:

Reply from 208.132.180.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron

Variables are written in slanted form as shown here:

ping xxx.xxx.xxx.xxx —t
SOH R Data STX Command ETB ETX

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the *File* menu, select *New*.
Click the *OK* button.

Specifications Availability

Product specifications are available on the Extron website, [www.extron.com](http://www.extron.com).

Extron Glossary of Terms

Introduction

About this Guide

This guide describes the Extron DTP T USW 233 switcher with an integrated DTP transmitter. The switcher outputs a signal to a compatible DTP receiver. This guide describes how to install, operate, and configure the switcher.

NOTE: In this guide, the DTP T USW 233 is commonly referred to as a “switcher” or a “switching transmitter.”

About the DTP T USW 233 Switcher

The DTP T USW 233 is a 3 input VGA and HDMI switcher with a DTP transmitter output (see figure 1). It switches among one analog VGA and two HDMI inputs, including embedded audio (or DVI video with the appropriate adapters). The switcher converts the selected input, an optional analog audio input, and bidirectional RS-232 and infrared (IR) control signals to a proprietary digital signal. It outputs the signal to a compatible DTP receiver. The switcher and receiver extend the usable distance of video, audio, and control signals up to 230 feet (70 meters) over a single shielded twisted pair cable (STP).

Figure 1. Typical Switching Transmitter Application

The DTP T USW 233 is housed in a half rack width metal enclosure. It can be set on a tabletop, mounted in a rack, or mounted under or through furniture.

The included external desktop 12 VDC power supply accepts 100 to 240 VAC, 50-60 Hz. A single power supply connected to either unit can power both units through the STP cable.
STP Cable

Extron recommends XTP DTP 24 shielded twisted pair (STP) cable for best performance. Extron recommends at least 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.

**ATTENTION:**

- Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the switching transmitter and receiver. The DTP T USW 233 does not work properly with these cables.
- N’utilisez pas le câble AV Skew-Free UTP version améliorée UTP23SF d’Extron ou le câble STP201 pour relier les produits XTP avec les émetteurs ou les récepteurs DTP.

Twisted pair cable is smaller, lighter, more flexible, and less expensive than coaxial cable. The DTP 230-enabled products make cable runs simpler and less cumbersome. Termination of the cable with RJ-45 connectors is simple, quick, and economical.

Control Communications

You can control this device through the front panel USB connector, the rear panel RS-232 connector, or through a DTP matrix. The RS-232 and IR communications are pass-through only. The switching transmitter and receiver do not generate or respond to the RS-232 and IR communication signals.

Features

Transmits HDMI or analog video, control, and analog audio up to 230 feet (70 meters) over a single STP cable — The DTP T USW 233 provides high reliability and maximum performance on an economical and easily installed cable infrastructure.

HDBaseT compatible — The DTP output can be configured to send video and embedded audio, plus bidirectional RS-232 and IR signals to an HDBaseT-enabled display.

Inputs — Two HDMI and one RGBHV on 15-pin HD, one 3.5 mm stereo mini jack for audio.

Supports computer video to 1920x1200, including HDTV 1080p/60 Deep Color and 2K — The DTP T USW 233 supports digital signal transmission up to 230 feet over a single twisted pair cable and maintains superior image quality at the highest resolutions.

Analog stereo audio embedding — Analog stereo audio signals can be selectively embedded onto the digital video output signal and transported over DTP. The HDMI inputs can be set to pass the embedded digital audio, embed the analog audio, or to automatically embed the analog audio when no digital audio is detected.

Accepts additional analog stereo audio signals — The DTP T USW 233 supports a direct pass-through connection for stereo analog audio signals for simultaneous transmission over the same single twisted pair cable. Analog audio is not embedded onto the digital video signal. A DTP 230 receiver can output balanced and unbalanced audio, allowing streamlined integration within an AV system.

Bidirectional RS-232 and IR insertion for AV device control — Control and IR signals can be transmitted alongside the video signal over DTP connections, allowing the remote device to be controlled without the need for additional cabling. Bidirectional control insertion eliminates the need for control system wiring to remote devices.

Remote power — For simplified installation, only one power supply is necessary to power both devices. The switcher can remotely power another connected extender or can be powered by a connected extender or matrix switcher.
Digital conversion of analog input signals — Analog signals are digitized, ensuring that a reliable, high quality digital video signal is sent to the output destination.

EDID Minder — Automatically manages EDID communication between connected devices, ensuring that all sources power up properly and reliably output content for display.

Key Minder — Authenticates and maintains continuous HDCP encryption between input and output devices, verifying HDCP compliance for quick, reliable switching in professional AV environments.

Compatible with all DTP 230 receivers, and DTP 230-enabled products — Enables mixing and matching with desktop and wallplate receivers, as well as other DTP 230-enabled products to meet application requirements.
Installation and Operation

This section describes the installation and the operation of the DTP T USW 233, including:

- Mounting the Unit
- Connections and Reset Button
- Operation
- Troubleshooting — If No Image Appears

Mounting the Unit

Mounting instructions can be found in Mounting the Switcher on page 31. Compatible optional hardware is listed on the Extron website (www.extron.com).

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L’installation et l’entretien doivent être effectués par le personnel autorisé uniquement.
- Avoid ground potential differences between the switching transmitter and receiver installation sites, which can lead to equipment damage or a missing or unstable picture. If a potential difference cannot be avoided, remove the ground connection between the units and locally power both units (see Disconnecting the Ground on page 32). In this configuration, the DTP T USW 233 cannot extend analog audio and the paired receiver requires its own dedicated power supply.
- Évitez les différences de potentiel de mise à la terre entre les sites d’installation de commutation émetteur récepteur, qui pourraient endommager l’équipement ou rendre l’image invisible ou instable. Si une différence de potentiel ne peut être évitée, enlevez la connexion de mise à la terre entre les unités et alimentez les deux unités localement (voir Disconnecting the Ground à la terre page 32). Dans cette configuration, le DTP T USW 233 ne peut transmettre l’audio analogique et le récepteur associé nécessite sa propre source d’alimentation dédiée.
Connections and Reset Button

Rear Panel Features

Figure 2. DTP T USW 233 Rear Panel Features

- **A** RGB input port (input 1)
- **B** HDMI input ports
- **C** TP function switch
- **D** Audio input port (see the next page)
- **E** Over DTP RS-232 and IR port
- **F** DTP Output RJ-45 port
- **G** Remote Contact port
- **H** Remote Tally port (see page 7)
- **I** Remote RS-232 port
- **J** Reset button
- **K** Power connector

**A** RGB input port (input 1) — Plug an analog (RGB) video source into the switching transmitter via this 15-pin HD connector. See VGA connector wiring on page 7 for connector pinout.

**B** HDMI input port (inputs 2 and 3) — Plug HDMI digital video sources into the switching transmitter via these HDMI connectors (see HDMI connector on page 8).

These connectors can also accept DVI video with appropriate adapters.

**C** TP function switch — Set this switch as follows, based on the receiver:

**ATTENTION:**
- Position this switch **BEFORE** connecting the appropriate device to the TP connector. Failure to comply can damage the endpoint.
- Positionnez le sélecteur AVANT de connecter l’appareil approprié au connecteur TP. Ne pas respecter cette procédure pourrait endommager le point de connexion.

**Receiving device is in the Extron DTP series** — Set this switch to the DTP position. The TP output consists of HDMI with embedded audio, analog audio, RS-232 and IR, and remote power. The switcher and receiver can be powered by one 12 VDC power supply connected to either unit.

**HDBaseT-enabled receiver type** — Set this switch to HDBT position. The TP output consists of HDMI with embedded audio plus RS-232 and IR. The switcher and receiver each requires its own 12 VDC power supply.
Audio input port (see figure 2 on the previous page) — If desired, plug an analog audio input into the switching transmitter via this stereo mini jack connector.

NOTES:
- The analog audio input on this connector is in addition to the digital audio that may be embedded in the HDMI inputs. See the figure at right to identify the connector tip, ring, and sleeve when you are making connections for the switching transmitter from existing audio cables. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring, and sleeve.
- If you have removed the ground jumpers (see Disconnecting the Ground on page 32) because of ground potential differences, the DTP T USW 233 cannot extend analog audio. The connected receiver outputs no analog audio.
- The analog audio can be assigned to a specific input or set to be always output (see Assign analog audio SIS commands on page 19).

Over DTP RS-232 and IR port — Plug a serial RS-232 signal, a modulated IR signal, or both into this 3.5 mm, 5-pole captive screw connector for bidirectional RS-232 and IR communication (see IR and RS-232 connector wiring on page 12 to wire the connector).

DTP Output RJ-45 port — Plug one end of a STP cable to this RJ-45 female connector on the switching transmitter. Plug the opposite end of this cable into the DTP Input RJ-45 connector on a compatible receiver (see STP cable termination and recommendations on page 9 to properly wire the RJ-45 connector and for detailed NOTES).

ATTENTION:
- Do not connect this device to a telecommunications or computer data network.
- Ne connectez pas ces appareils à des données informatiques ou à un réseau de télécommunications.

Signal LED — Lights when the unit is outputting a TMDS clock signal on the DTP output.

Link LED — Indicates a valid link is established between the units.

Remote Contact port — If desired, for contact closure control, plug a locally-constructed contact closure device into this 3.5 mm, 4-pole captive screw port. Momentarily short the pin for the desired input (1, 2, or 3) to G to select that input. To force an input to be always selected, leave the short in place (see Contact Closure Control on page 16).

NOTES:
- Contact closure control overrides front panel input selections.
- For contact closure control, auto switch mode must be off (see Selecting the switch mode on page 15).
Remote Tally port (see figure 2 on page 5) — If desired, to remotely identify the currently selected input, plug a locally-constructed device into this 3.5 mm, 4-pole captive screw connector. Connect the power wire for the device into the +V pin and connect the ground wire for each indicator into the corresponding tally out pin, 1, 2, or 3.

When an input is selected, by either contact closure or front panel selection or SIS, the corresponding tally out pin shorts to ground, closing the circuit and lighting the connected indicator (LED).

Remote RS-232 port — Plug a serial RS-232 device into the switching transmitter via this 3.5 mm, 3-pole captive screw connector for remote control of the switching transmitter (see IR and RS-232 connector wiring on page 12 to wire the connector).

Reset button — The Reset button initiates two levels of reset of the switcher. For the different reset levels, press and hold the button while the switcher is running or while you power up the switcher (see Reset on page 15 for details).

Power connector — Plug the included external 12 VDC power supply into either this 2-pole connector (see Power supply wiring on page 10 to wire the connector) or the power input connector on the receiver (see the receiver user guide on the Extron website).

NOTES:
- The power supply included with the switching transmitter can normally power both units.
- If you have removed the ground jumpers (see Disconnecting the Ground on page 32) because of ground potential differences, one unit of the pair cannot remotely power the other unit. Each unit requires a local power supply.

Connector and Cable Details

VGA connector wiring

The 15-pin HD (VGA) universal analog input ports accept RGB video (RGBHV, RGBS, RGsB). Figure 3 shows the pinouts for each format type on the connector.

<table>
<thead>
<tr>
<th>Pin</th>
<th>RGBHV</th>
<th>RGBS/RGsB</th>
<th>Pin</th>
<th>RGBHV</th>
<th>RGBS/RGsB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Red</td>
<td>9</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
<td>Green</td>
<td>10</td>
<td>Ground</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>Blue</td>
<td>11</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>4, 5</td>
<td>NC</td>
<td>NC</td>
<td>12</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>Red return</td>
<td>Red return</td>
<td>13</td>
<td>H sync</td>
<td>C sync</td>
</tr>
<tr>
<td>7</td>
<td>Green return</td>
<td>Green return</td>
<td>14</td>
<td>V sync</td>
<td>NC</td>
</tr>
<tr>
<td>8</td>
<td>Blue return</td>
<td>Blue return</td>
<td>15</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>

Figure 3. VGA Connector
HDMI connector

HDMI signals run at a very high frequency and are especially prone to errors caused by bad video connections, too many adapters, or excessive cable length. To avoid the loss of an image or jitter, follow these guidelines:

- Do not exceed 16.4 feet (5 meters) on the input of the transmitter or the output of the connected receiver.
- Use only the cable designed for HDMI signals that is supplied by Extron.
- Limit or avoid the use of adapters.
- Use only cables specifically intended for HDMI or DVI signals. Use of non-HDMI or non-DVI cables or modified cables can result in a missing video output.

To secure a fasten an HDMI cable to a device:

1. Plug the HDMI cable into the panel connection (see figure 4, \(\text{1}\)).

   ![Figure 4. Installing the LockIt Lacing Bracket](image)

   **Figure 4. Installing the LockIt Lacing Bracket**

2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (\(\text{2}\)). The screw does not have to be removed.

3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket (\(\text{3}\)).

**ATTENTION:**

- Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.
- Ne serrez pas trop la vis de montage du connecteur HDMI. Le blindage auquel elle est attachée est très fin et peut facilement être dénudé.

4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown (\(\text{4}\)).

5. While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length (\(\text{5}\)).
STP cable termination and recommendations

Figure 5 details the TIA/EIA T 568B wiring standard. Use this standard to terminate the DTP cable with RJ-45 connectors.

![Diagram of RJ-45 Connector and TIA/EIA T 568B Wire Color](image)

**ATTENTION:** Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the switching transmitter and receiver. The DTP T USW 233 does not work properly with these cables.

N’utilisez pas le câble AV Skew-Free UTP version améliorée UTP23SF d’Extron ou le câble STP201 pour relier les produits XTP avec les émetteurs ou les récepteurs DTP.

**Supported cables**

The DTP T USW 233 is compatible with shielded twisted pair (STP) and unshielded twisted pair (U/UTP) cable. However, Extron strongly recommends that you use STP cable to achieve best performance.

**Cable recommendations**

Extron recommends using the following practices to achieve full transmission distances up to 230 feet (70 meters) and reduce transmission errors.

- Use the following Extron XTP DTP 24 STP cables and DTP 24 connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000 feet (305 meters) spool 22-236-03
  - **XTP DTP 24P/1000** Plenum 1000 feet (305 meters) spool 22-235-03
  - **XTP DTP 24 Plug** Package of 10 101-005-02
- If not using XTP DTP 24 cable, at a minimum, Extron recommends 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA-T568B standard.
- Use no more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use Catagory 6 or 6a shielded couplers and punch down connectors.

**NOTE:** When using STP cable in bundles or conduits, consider the following:

- Do not exceed 40% fill capacity in conduits.
- Do not comb the cable for the first 20 meters, where cables are straightened, aligned, and secured in tight bundles.
- Loosely place cables and limit the use of tie wraps or hook-and-loop fasteners.
- Separate twisted pair cables from AC power cables.
Power supply wiring

NOTES:

- The power supply included with the switching transmitter can normally power both units.
- If you have removed the ground jumpers (see Disconnecting the Ground on page 32) because of ground potential differences, one unit of the pair cannot remotely power the other unit. Each unit requires a local power supply.

Figure 6 shows how to wire the connector. Use the supplied tie-wrap to strap the power cord to the extended tail of the connector.

Figure 6. Power Connector Wiring

CAUTION:
ATTENTION:

- The wires must be kept separate while the power supply is plugged in. Remove power before wiring.
- Les deux cordons d’alimentation doivent être tenus à l’écart l’un de l’autre quand l’alimentation est branchée.
- The length of exposed wires is important. The ideal length is 3/16 inch (5 mm).
  - Any longer and the exposed wires may touch, causing a short circuit between them.
  - Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws.
  - La longueur des câbles exposés est importante. La longueur idéale est de 5 mm (3/16 inches).
  - S’ils sont un peu plus longs, les câbles exposés pourraient se toucher et provoquer un court circuit.
  - S’ils sont un peu plus courts, ils pourraient sortir, même s’ils sont attachés par les vis captives.
- Do not tin the power supply leads before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.
- Ne pas étamer les conducteurs avant de les insérer dans le connecteur. Les câbles étamés ne sont pas aussi bien fixés dans le connecteur et pourraient être retirés.
ATTENTION:

- This product is intended to be supplied by a UL Listed power source marked “Class 2” or “LPS,” rated 12 VDC, 1.0 A minimum. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.

- Ce produit est destiné à une utilisation avec une source d’alimentation listée UL avec l’appellation « Classe 2 » ou « LPS » et normée 12 Vcc, 1,0 A minimum. Utilisez toujours une source d’alimentation fournie ou recommandée par Extron. L’utilisation d’une source d’alimentation non autorisée annule toute conformité réglementaire et peut endommager la source d’alimentation ainsi que le produit final.

- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities.

- Sauf mention contraire, les adaptateurs AC/DC ne sont pas appropriés pour une utilisation dans les espaces d’aération ou dans les cavités murales.

- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 725 and the Canadian Electrical Code part 1, section 16. The power supply shall not be permanently fixed to a building structure or similar structure.

- Cette installation doit toujours être en accord avec les mesures qui s’appliquent au National Electrical Code ANSI/NFPA 70, article 725, et au Canadian Electrical Code, partie 1, section 16. La source d’alimentation ne devra pas être fixée de façon permanente à une structure de bâtiment ou à une structure similaire.

- Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the unit. The ridges on the side of the cord (see figure 6 on the previous page) identify the power cord negative lead.


To verify the polarity before connection, plug in the power supply with no load and check the output with a voltmeter.
**IR and RS-232 connector wiring**

Figure 7 shows how to wire the Remote RS-232 and Over DTP RS-232 and IR connectors. The RS-232 and IR connectors share the ground pole and the data from both can be transmitted simultaneously.

![IR and RS-232 Connectors Wiring](image)

**NOTES:**

- The IR Tx and Rx line pair and the RS-232 Tx and Rx line pairs must each cross once between their connectors and the source or destination.
- The length and preparation of exposed wires is important (see the second and third power connector CAUTIONS on page 10 for details).

**Front Panel Configuration Port**

![Configuration Port](image)

**Figure 8.  Front Panel Configuration (Config) Port**

**NOTE:** A front panel configuration port connection and a rear panel Remote RS-232 port connection can both be active at the same time. If commands are sent simultaneously to both, the command that reaches the processor first is handled first.
Operation

Controls and Indications

Figure 9. DTP T USW 233 Front Panel Controls and Indicators

A Auto Switch LED — see Selecting the switch mode on page 15.
B Input 1 through 3 buttons — Each Input button selects the associated input for output (see Switching inputs on page 14).
C Input 1 through 3 LEDs — The input LEDs identify the selected input.
D Mode button — The Mode button is used with the Normal button or the Auto button to select the switching mode (see Selecting the switch mode).
E Normal button — The Normal button is used with the Mode button to select normal mode (see Selecting the switch mode).
F Auto(switch) button — The Auto button is used with the Mode button to select auto-input switching mode (see Selecting the switch mode).

Auto Switch mode indicator

A Auto Switch LED — see Selecting the switch mode on page 15.

Input selection controls and indicators

B Input 1 through 3 buttons — Each Input button selects the associated input for output (see Switching inputs on page 14).
C Input 1 through 3 LEDs — The input LEDs identify the selected input.
D Mode button — The Mode button is used with the Normal button or the Auto button to select the switching mode (see Selecting the switch mode).
E Normal button — The Normal button is used with the Mode button to select normal mode (see Selecting the switch mode).
F Auto(switch) button — The Auto button is used with the Mode button to select auto-input switching mode (see Selecting the switch mode).

When you change from auto-input switching to normal (manual) mode, the last input selected in auto-input switching mode remains selected until you manually select a different input.

When you change from auto-input switching to normal (manual) mode, the last input selected in auto-input switching mode remains selected until you manually select a different input.

When you change from auto-input switching to normal (manual) mode, the last input selected in auto-input switching mode remains selected until you manually select a different input.
Status LEDs

**Status LEDs** (see figure 9 on the previous page) —
- **Signal LEDs (1 through 3)** — Indicates that the switcher detects horizontal sync (Signal LED 1) or TMDS clock (Signal LED 2 and Signal LED 3) on the associated input.
- **HDCP LEDs (2 and 3)** — Indicates that the input signal is HDCP-encrypted.

Front Panel Operations

The following paragraphs detail the power up process and provide sample procedures for switching inputs, changing between normal and auto-input switching mode, and toggling executive mode on and off.

**Power**

Power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that blinks the front panel LEDs during the test. An error-free power up self-test sequence leaves the Auto Switch and Input LEDs on or off in the same configuration as they were when power was last removed.

If an error occurs during the self-test, the switcher locks up and will not operate. If your switcher locks up on power-up, call the Extron S3 Sales & Technical Support Hotline. See the Extron Web page for the Extron office nearest you.

Plug in all system components and turn on the input devices (such as Blu-Ray players and computers) and the output devices. Set the input devices to output video using the operating instructions of that device. Select an input. The image should appear on the screen. If no image appears, see **Troubleshooting — If No Image Appears** on the next page.

**Switching inputs**

Select an input for transmission to the receiver using the front panel buttons as follows:

1. Select the desired input by pressing the associated input button (see figure 10).

   - Press the button.
   - The LED lights green.

   **Figure 10. Selecting an Input**

2. Observe that the LED for the selected input lights.

   **NOTE:** The switcher must be in normal (manual) mode.

An input can also be selected using an RS-232 or USB device or a contact closure device (see **Remote Control**, beginning on page 16).
Selecting the switch mode

**NOTE:** In the auto-input switching mode that is available from the front panel, the switcher selects the highest numbered input with a sync signal present. See the Front panel mode SIS commands on page 19 for an auto-input switching low mode, which selects the lowest numbered input.

Turn auto-input switching mode on and off as follows:

1. Press and hold the **Mode (Input 1)** button and the button for the desired mode for approximately 5 seconds (see figure 11):
   - **Auto (Input 3)** — The Auto Switch LED lights.
   - **Normal (Input 2)** — The Auto Switch Active LED goes off.

   ![figure 11. Selecting a Mode](image)

   **Figure 11. Selecting a Mode**

2. Release the buttons.

Front panel security lockout (Executive mode)

The switcher has a front panel lock feature that locks the front panel. If you try to make front panel input selections when the panel is locked, all front panel LEDs blink three times.

Toggle the front panel lock on and off as follows:

1. Push and **hold** the **Input 1**, **Input 2**, and **Input 3** buttons simultaneously for 5 seconds.
   - All front panel LEDs blink three times.

2. Release the buttons.

When the front panel is locked, contact closure, USB, and RS-232 control are still available.

Reset

Use the recessed rear panel **Reset** button to initiate reset as follows:

**Reset to default settings** — Press and **hold** the **Reset** button for approximately 6 seconds. All front panel LEDs cycle. Release the button. This reset is the equivalent of issuing the **Reset** SIS command (**E**ZXX,**X**, see page 21).

Troubleshooting — If No Image Appears

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the input LEDs is lit.
2. Ensure an active input is selected on the switcher or that the switcher is in auto-input switching mode.
3. Ensure that the proper signal format is supplied.
4. Check the cabling and make corrections as necessary.
5. Call the Extron S3 Sales & Technical Support Hotline if necessary. See the Extron website for the Extron office nearest you.
Remote Control

This section includes:

- **Contact Closure Control**
- **Simple Instruction Set Control**
- **Product Configuration Software**

The DTP T USW 233 switcher can be remotely controlled via its rear panel Remote RS-232 port, its front panel configuration (USB) port, and its rear panel Remote Contact port. Remote control devices can be:

- A host device such as a computer or control system and the Extron Simple Instruction Set
- A contact closure device such as an Extron KP 6 Keypad Control or a video cable

**Contact Closure Control**

The rear panel Remote Contact port (see item 6 on page 6) provides a way to select an input to the switcher using a remote contact closure device. The contact closure pin assignments are shown on page 6.

**NOTE:** The switcher must be in normal (manual) mode.

To select a different input number using a contact closure device, momentarily short the pin for the desired input number to ground. To force one of the inputs to be always selected, leave the short to ground in place. The short overrides front panel input selections.
Simple Instruction Set Control

The DTP T USW 233 switching transmitter can be remotely controlled using SIS commands from a host device such as a computer or control system via its rear panel Remote RS-232 port (see item 1 on page 7) or front panel configuration (USB) port (see item A on page 12).

The default serial port protocol of the port is as follows:

- 9600 baud
- No parity
- 8-bit
- No flow control
- 1 stop bit

Host-to-Switcher Communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the switcher executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = 

Switcher-Initiated Messages

When a local event occurs, such as a front panel operation, loss or restoration of an input signal, or an error condition, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below:

© Copyright 20yy, Extron Electronics DTP T USW 233, Vx.xx, 60-nnnn-nn

The switcher issues the copyright message when it first powers on. Vx.xx is the firmware version number and 60-nnnn-nn is the part number.

Inn All

The switcher also sends the Inn message whenever the selected input is changed. n is the input number. A 0 in the n field indicates no input is selected.

Error responses

When the switcher receives a valid SIS command, it executes the command and sends a response to the host device. If the switcher is unable to execute the command because the command is invalid or it contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

- E01 — Invalid input channel number (out of range)
- E06 — Invalid channel change
- E10 — Invalid command
- E13 — Invalid parameter

Timeout

Pauses of 10 seconds or longer between command ASCII characters result in a timeout. The command operation is aborted with no other indication.
Using the Command and Response Table

The command and response table begins on the next page. Symbols are used throughout the table to represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands are not case sensitive. The ASCII to HEX conversion table below is for use with the command and response table.

### ASCII to Hex Conversion Table

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Hex Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space</td>
<td>00H</td>
</tr>
<tr>
<td>CR</td>
<td>0D</td>
</tr>
<tr>
<td>LF</td>
<td>0A</td>
</tr>
<tr>
<td>20 21</td>
<td>02 03</td>
</tr>
<tr>
<td>02 03</td>
<td>02 03</td>
</tr>
<tr>
<td>0A 0D</td>
<td>0A 0D</td>
</tr>
<tr>
<td>02 03</td>
<td>02 03</td>
</tr>
<tr>
<td>0A 0D</td>
<td>0A 0D</td>
</tr>
</tbody>
</table>

### Symbol definitions

- **Space**: Carriage return/line feed
- **CR**: Carriage return (no line feed)
- **LF**: Pipe (can be used interchangeably with the CR character)
- **E**: Escape key
- **W**: Can be used interchangeably with the E character
- **X!**: Input number 0 or 1 through 3 (0 = no input for switching command or always output for audio assignment)
- **X@**: Switch mode 0 = Manual (default) 1 = Auto-input switching high
- **X#**: Status 0 = Off, disabled, or not detected 1 = On, enable, or detected
- **X%**: Input HDCP status 0 = No source is detected 1 = Source detected with HDCP 2 = Source detected without HDCP
- **X^**: Output HDCP status 0 = No sink is detected 1 = Sink detected with HDCP 2 = Sink detected without HDCP
- **X&**: EDID See the table on page 20.
- **X***: User EDID location 66, 67, or 68
- **X(**: Raw EDID data 128 or 256 bytes of hexadecimal data
- **X1)**: Resolution and rate in plain text Example: 1920x1200 59Hz
- **X1@**: Switch position 0 = DTP 1 = HDBT
- **X1#**: Switcher name A text string of up to 24 alphanumeric characters and minus sign/hyphen (-). No blank or space characters are permitted as part of a name. The first character must be a letter, and the last character must not be a minus sign/hyphen.
- **X1$**: Embed audio 0 = Embedded digital audio 1 = Analog audio input 2 = Auto select (Digital takes priority) (default)
- **X1%**: Tally pin mode when channel is muted 0 = Always on (default) 1 = Off when muted 2 = Blink when muted
- **X1^**: Firmware version number to second decimal place (x.xx)
- **X1&**: Verbose mode 0 = Clear/none 1 = Verbose mode (default) 2 = Tagged responses for queries 3 = Verbose mode and tagged for queries

### NOTE

Auto-input switch low (X@ = 2) is not available from the front panel.
## Command and Response Table for SIS Commands

<table>
<thead>
<tr>
<th>Command Function</th>
<th>SIS Command (Host to Unit)</th>
<th>Response (Unit to Host)</th>
<th>Additional description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select and view input</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select an input</td>
<td>![X]!</td>
<td>![InX]*All↓</td>
<td>Select input ![X] to transmit to the connected receiver. Select input ![X]! to transmit to ![X]! to the connected receiver. Select input ![X] is selected.</td>
</tr>
<tr>
<td>Example:</td>
<td>![1]!</td>
<td>![In1]*All↓</td>
<td></td>
</tr>
<tr>
<td>View input selection</td>
<td>![ ]</td>
<td>![X1]↓</td>
<td></td>
</tr>
<tr>
<td><strong>Front panel mode</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set normal switch mode</td>
<td>![Eg3] Ausw↓</td>
<td>Ausw↓↓</td>
<td>Set switch mode to normal. Default.</td>
</tr>
<tr>
<td>Set auto switch mode high</td>
<td>![Eg1] Ausw↓</td>
<td>Ausw↓↓</td>
<td>Set switch mode to auto (high). The switcher automatically selects the highest-numbered input with a signal present.</td>
</tr>
<tr>
<td>Set auto switch mode low</td>
<td>![Eg2] Ausw↓</td>
<td>Ausw↓↓</td>
<td>Set switch mode to auto (low). The switcher automatically selects the lowest-numbered input with a signal present.</td>
</tr>
<tr>
<td>View front panel switch mode</td>
<td>![Eg3] Ausw↓</td>
<td>![X1]↓</td>
<td></td>
</tr>
<tr>
<td><strong>Assign analog audio input to specific video input or always output audio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always output analog audio</td>
<td>![Eg3] Aflw↓</td>
<td>Aflw↓↓</td>
<td>Analog audio is output regardless of input selection. Default.</td>
</tr>
<tr>
<td>Assign (lock) analog audio to a specific input</td>
<td>![Eg1] Aflw↓</td>
<td>Aflw↓↓</td>
<td>Assign analog audio to input ![X1]!</td>
</tr>
<tr>
<td>View audio assignment</td>
<td>![Eg3] Aflw↓</td>
<td>![X1]↓</td>
<td></td>
</tr>
<tr>
<td><strong>Input signal status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request status of all inputs and the output</td>
<td>![Eg1] Ls↓</td>
<td>![X]↓↓</td>
<td>![X]↓↓ through ![X]↓↓ are the signal status of inputs 1 through 3. ![X]↓↓ is the output signal status.</td>
</tr>
<tr>
<td><strong>HDCP status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>View the HDCP status of an HDMI input</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>Verbose mode 2 and 3.</td>
</tr>
<tr>
<td>View the HDCP status of both HDMI inputs</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>Verbose mode 2 and 3.</td>
</tr>
<tr>
<td>View the output HDCP status</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>Verbose mode 2 and 3.</td>
</tr>
<tr>
<td><strong>HDCP Authorized device</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set HDMI input to HDCP authorized</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>1 = Authorized. Default.</td>
</tr>
<tr>
<td>Set HDMI input to HDCP not authorized</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>2 = Auto-input switching low</td>
</tr>
<tr>
<td>Set HDCP authorization, both HDMI inputs</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td>Status of input 2 and input 3. Verbose mode 2 and 3.</td>
</tr>
<tr>
<td>View HDCP authorized status</td>
<td>![Eg1] Hdcπ↓</td>
<td>![X]↓↓</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
- ![X] = Input number 0 or 1 through 3 (0 = no input for switching command or always output for audio assignment) 
- ![X] = Switch mode 0 = Manual (default) 1 = Auto-input switching high 2 = Auto-input switching low 
- ![X] = Status 0 = Not detected, authorized 1 = Detected, authorized 
- ![X] = HDMI input 2 or 3 
- ![X] = Input HDCP status 0 = No source detected 1 = Source detected with HDCP 2 = Source detected without HDCP 
- ![X] = Output HDCP status 0 = No sink detected 1 = Sink detected with HDCP 2 = Sink detected without HDCP
## Command and Response Table for SIS Commands (continued)

<table>
<thead>
<tr>
<th>Command Function</th>
<th>SIS Command (Host to Unit)</th>
<th>Response (Unit to Host)</th>
<th>Additional description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDID Minder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assign EDID to an input</td>
<td>EdidAUX-EIDID</td>
<td>EdidX&amp;</td>
<td>Defaults: 03 and 58.</td>
</tr>
<tr>
<td>Save the EDID of the connected display to a user location</td>
<td>EdidAUX-EIDID</td>
<td>EdidX&amp;</td>
<td>Save EDID of display connected to the output to the user store slot 66, 67, or 68.</td>
</tr>
<tr>
<td>View the EDID assignment</td>
<td>EdidAUX-EIDID</td>
<td>X(</td>
<td>Read data as text from the EDID assigned and used on input X1.</td>
</tr>
<tr>
<td>View raw EDID data</td>
<td>EdidAUX-EIDID</td>
<td>X(</td>
<td>Read out native resolution and refresh rate from the EDID assigned to the specified input in plain text. Example: 1920x1200 @60.00Hz</td>
</tr>
<tr>
<td>View EDID native resolution</td>
<td>EdidAUX-EIDID</td>
<td>X(1)</td>
<td></td>
</tr>
</tbody>
</table>

### EDID Values

<table>
<thead>
<tr>
<th>VGA – PC values</th>
<th>Value</th>
<th>VGA – PC values</th>
<th>Value</th>
<th>VGA – PC values</th>
<th>Value</th>
<th>VGA – PC values</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>800x600 @ 60 Hz</td>
<td>05</td>
<td>1280x800 @ 60 Hz</td>
<td>09</td>
<td>1400x1050 @ 60 Hz</td>
<td>13</td>
<td>1680x1050 @ 60 Hz</td>
</tr>
<tr>
<td>02</td>
<td>1024x768 @ 60 Hz</td>
<td>06</td>
<td>1280x1024 @ 60 Hz</td>
<td>10</td>
<td>1440x900 @ 60 Hz</td>
<td>14</td>
<td>1920x1080 @ 60 Hz</td>
</tr>
<tr>
<td>03*</td>
<td>1280x720 @ 60 Hz</td>
<td>07</td>
<td>1360x768 @ 60 Hz</td>
<td>11</td>
<td>1600x900 @ 60 Hz</td>
<td>15</td>
<td>1920x1200 @ 60 Hz</td>
</tr>
<tr>
<td>04</td>
<td>1280x768 @ 60 Hz</td>
<td>08</td>
<td>1366x768 @ 60 Hz</td>
<td>12</td>
<td>1600x1200 @ 60 Hz</td>
<td>16</td>
<td>2048x1080 @ 60 Hz</td>
</tr>
</tbody>
</table>

### DVI – PC values

<table>
<thead>
<tr>
<th>DVI – PC values</th>
<th>Value</th>
<th>DVI – PC values</th>
<th>Value</th>
<th>DVI – PC values</th>
<th>Value</th>
<th>DVI – PC values</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>800x600 @ 60 Hz</td>
<td>21</td>
<td>1280x800 @ 60 Hz</td>
<td>25</td>
<td>1400x1050 @ 60 Hz</td>
<td>29</td>
<td>1680x1050 @ 60 Hz</td>
</tr>
<tr>
<td>02</td>
<td>1024x768 @ 60 Hz</td>
<td>22</td>
<td>1280x1024 @ 60 Hz</td>
<td>26</td>
<td>1440x900 @ 60 Hz</td>
<td>30</td>
<td>1920x1080 @ 60 Hz</td>
</tr>
<tr>
<td>03</td>
<td>1280x720 @ 60 Hz</td>
<td>23</td>
<td>1360x768 @ 60 Hz</td>
<td>27</td>
<td>1600x900 @ 60 Hz</td>
<td>31</td>
<td>1920x1200 @ 60 Hz</td>
</tr>
<tr>
<td>04</td>
<td>1280x768 @ 60 Hz</td>
<td>24</td>
<td>1366x768 @ 60 Hz</td>
<td>28</td>
<td>1600x1200 @ 60 Hz</td>
<td>32</td>
<td>2048x1080 @ 60 Hz</td>
</tr>
</tbody>
</table>

### HDMI – PC values, with 2-channel audio

<table>
<thead>
<tr>
<th>HDMI – PC values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – PC values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – PC values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – PC values, with 2-channel audio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>800x600 @ 60 Hz</td>
<td>33</td>
<td>1280x1024 @ 60 Hz</td>
<td>41</td>
<td>1440x900 @ 60 Hz</td>
<td>45</td>
<td>1920x1200 @ 60 Hz</td>
</tr>
<tr>
<td>02</td>
<td>1024x768 @ 60 Hz</td>
<td>34</td>
<td>1360x768 @ 60 Hz</td>
<td>42</td>
<td>1600x900 @ 60 Hz</td>
<td>46</td>
<td>2048x1080 @ 60 Hz</td>
</tr>
<tr>
<td>03*</td>
<td>1280x768 @ 60 Hz</td>
<td>35</td>
<td>1366x768 @ 60 Hz</td>
<td>43</td>
<td>1600x1200 @ 60 Hz</td>
<td>32</td>
<td>2048x1080 @ 60 Hz</td>
</tr>
<tr>
<td>04</td>
<td>1280x800 @ 60 Hz</td>
<td>36</td>
<td>1400x1050 @ 60 Hz</td>
<td>44</td>
<td>1680x1050 @ 60 Hz</td>
<td>46</td>
<td>2048x1080 @ 60 Hz</td>
</tr>
</tbody>
</table>

### HDMI – HDTV values, with 2-channel audio

<table>
<thead>
<tr>
<th>HDMI – HDTV values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with 2-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with 2-channel audio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>480p @ 60 Hz</td>
<td>47</td>
<td>720p @ 60 Hz</td>
<td>53</td>
<td>1080p @ 50/25 Hz</td>
<td>56</td>
<td>1080p @ 60 Hz</td>
</tr>
<tr>
<td>02</td>
<td>576p @ 50 Hz</td>
<td>48</td>
<td>1080i @ 50 Hz</td>
<td>54</td>
<td>1080p @ 50 Hz</td>
<td>56</td>
<td>1080p @ 60 Hz</td>
</tr>
<tr>
<td>03*</td>
<td>720p @ 50 Hz</td>
<td>49</td>
<td>1080i @ 60 Hz</td>
<td>55</td>
<td>1080p @ 60/24 Hz</td>
<td>56</td>
<td>1080p @ 60 Hz</td>
</tr>
</tbody>
</table>

### HDMI – HDTV values, with multi-channel audio

<table>
<thead>
<tr>
<th>HDMI – HDTV values, with multi-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with multi-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with multi-channel audio</th>
<th>Value</th>
<th>HDMI – HDTV values, with multi-channel audio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>720p @ 50 Hz</td>
<td>57</td>
<td>1080i @ 50 Hz</td>
<td>61</td>
<td>1080p @ 50/25 Hz</td>
<td>63</td>
<td>1080p @ 60/24 Hz</td>
</tr>
<tr>
<td>02</td>
<td>720p @ 60 Hz</td>
<td>58</td>
<td>1080i @ 60 Hz</td>
<td>62</td>
<td>1080p @ 50 Hz</td>
<td>64</td>
<td>1080p @ 60 Hz</td>
</tr>
</tbody>
</table>

### Output and user locations

<table>
<thead>
<tr>
<th>Output and user locations</th>
<th>Source</th>
<th>Source</th>
<th>Source</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X1</td>
<td>X2</td>
<td>X3</td>
<td>X4</td>
</tr>
<tr>
<td>Output</td>
<td>65</td>
<td>66</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>User location 1</td>
<td>66</td>
<td>Source</td>
<td>67</td>
<td>Source</td>
</tr>
<tr>
<td>User location 2</td>
<td>67</td>
<td>66</td>
<td>68</td>
<td>Source</td>
</tr>
<tr>
<td>User location 3</td>
<td>68</td>
<td>67</td>
<td>69</td>
<td>Source</td>
</tr>
</tbody>
</table>

* Default for input 1.
† Default for inputs 2 and 3.

**NOTE:**
- X1 = Input number
- X2 = EDID
- X3 = User EDID location
- X4 = Raw EDID data
- X5 = Resolution and rate in plain text
- 1 through 3
- See the table above.
- 66, 67, or 68
- 128 or 256 bytes of hexadecimal data
- Example: 1920x1200 @60.00Hz
## Command and Response Table for SIS Commands (continued)

<table>
<thead>
<tr>
<th>Command Function</th>
<th>SIS Command (Host to Unit)</th>
<th>Response (Unit to Host)</th>
<th>Additional description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Front panel security lockout (executive mode)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lock front panel</td>
<td>1X Exe1</td>
<td>X3</td>
<td>Set lock on.</td>
</tr>
<tr>
<td>Unlock front panel</td>
<td>0X Exe0</td>
<td></td>
<td>Set lock off. Default.</td>
</tr>
<tr>
<td>Read lock status</td>
<td>X</td>
<td></td>
<td>Lock status = X3.</td>
</tr>
<tr>
<td><strong>Audio routing selection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set input audio format</td>
<td>E61X1AFMT</td>
<td>Afmt1X1</td>
<td>Embedded digital takes priority</td>
</tr>
<tr>
<td>View input audio format</td>
<td>E611AFMT</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Video mute</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mute video</td>
<td>1B Vmt1</td>
<td>X3</td>
<td>Output no video signal.</td>
</tr>
<tr>
<td>Unmute video</td>
<td>0B Vmt0</td>
<td>X3</td>
<td>Output selected video input.</td>
</tr>
<tr>
<td>Read video mute</td>
<td>B</td>
<td>X3</td>
<td>Mute status = X3.</td>
</tr>
<tr>
<td><strong>Analog audio mute</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mute analog audio</td>
<td>1Z Amt1</td>
<td>X3</td>
<td>Output no analog audio signal.</td>
</tr>
<tr>
<td>Unmute analog audio</td>
<td>0Z Amt0</td>
<td>X3</td>
<td>Output analog audio input.</td>
</tr>
<tr>
<td>Read analog audio mute</td>
<td>Z</td>
<td>X3</td>
<td>Analog audio mute status = X3.</td>
</tr>
<tr>
<td><strong>Disable (mute) HDMI output embedded audio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mute HDMI audio output</td>
<td>E61AFMT</td>
<td>Afmt1</td>
<td>Mute HDMI audio.</td>
</tr>
<tr>
<td>Unmute HDMI audio output</td>
<td>E60AFMT</td>
<td>Afmt0</td>
<td>Unmute HDMI audio. Default</td>
</tr>
<tr>
<td>View HDMI audio mute status</td>
<td>E61AFMT</td>
<td>X3</td>
<td></td>
</tr>
<tr>
<td><strong>TP function switch position</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>View switch position</td>
<td>E601HDBT</td>
<td>Hdbt01</td>
<td>The “Hdbt01*” portion of response is returned in Verbose mode 2 and 3 only.</td>
</tr>
<tr>
<td><strong>Channel mute (deselect) mode – via contact and tally pins</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set mode</td>
<td>E60X1Mutm</td>
<td>X1Mutm</td>
<td>Selects 0 channel if reselect input.</td>
</tr>
<tr>
<td>View setting</td>
<td>E60Mutm</td>
<td>X1</td>
<td>Via contact closure.</td>
</tr>
<tr>
<td><strong>Device name</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set the unit name</td>
<td>E60X1Ipn</td>
<td>IpnX1</td>
<td>Change the name to one of your choosing.</td>
</tr>
<tr>
<td>Set unit name to factory default</td>
<td>E60DTP-T-USW-233</td>
<td>IpnDTP-T-USW-233</td>
<td>Set name to default.</td>
</tr>
<tr>
<td>View unit name</td>
<td>E60Ipn</td>
<td>X1</td>
<td></td>
</tr>
<tr>
<td><strong>Reset</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reset to factory setting</td>
<td>E62ZXXX</td>
<td>Zpx</td>
<td>Reset to factory defaults.</td>
</tr>
</tbody>
</table>

**NOTE:**

- X0 = Input number
- X9 = Switch mode
- X8 = Status
- X7 = Switch position
- X6 = Switcher name
- X5 = Embed audio
- X4 = Tally pin mode when channel is muted

- 0 or 1 through 3 (0 = always output for audio assignment)
- 0 = Manual (default)
- 1 = Auto-input switching high
- 0 = Off or disabled
- 0 = Off or enabled
- 0 = DTP
- 0 = HDBT
- A text string of up to 24 alphanumeric characters and minus sign/hyphen (-)
- 0 = Embedded digital audio
- 1 = Analog audio input
- 0 = Always on (default)
- 1 = Off when muted
## Command and Response Table for SIS Commands (continued)

<table>
<thead>
<tr>
<th>Command Function</th>
<th>SIS Command (Host to Unit)</th>
<th>Response (Unit to Host)</th>
<th>Additional description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information requests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information request</td>
<td>I</td>
<td>In1\text{!}Vid!In1\text{!}Aud!Aflw2!Ausw1!Vmt!Amt0!</td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td>I</td>
<td>In1\text{!}Vid!In1\text{!}Aud!Aflw2!Ausw1!Vmt!Amt0!</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Input 1 is selected, analog audio is assigned to input 2, the switcher is in auto-input switching (high) mode, video is muted and analog audio is unmuted.</td>
</tr>
<tr>
<td>Request part number</td>
<td>N</td>
<td>66-nnnn-nn!</td>
<td>See <a href="http://www.extron.com">www.extron.com</a> for part numbers.</td>
</tr>
<tr>
<td>Query controller firmware version</td>
<td>Q</td>
<td>1.23</td>
<td>The factory-installed controller firmware version is 1.23 (sample value only).</td>
</tr>
<tr>
<td>Example:</td>
<td>Q</td>
<td>1.23</td>
<td></td>
</tr>
</tbody>
</table>

### NOTE:
- If tagged responses are enabled (modes 2 and 3), all "view" commands return the prefix and the value, just as the "set" commands do. For example, the View front panel switch mode (\text{E}AUSW\!\text{!}) command returns "AuswX@\!".

#### Verbose mode

<table>
<thead>
<tr>
<th>Command Function</th>
<th>SIS Command (Host to Unit)</th>
<th>Response (Unit to Host)</th>
<th>Additional description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set verbose mode</td>
<td>\text{EX1}!&amp;!CV!\text{!}Vrb!X@!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read verbose mode</td>
<td>\text{EX1}!&amp;!CV!\text{!}X@!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTE:
- \(X1\) = Input number
- \(X2\) = Switch mode
- \(X3\) = Status
- \(X1B\) = Firmware version number to second decimal place (x.xx)
- \(X1P\) = Verbose mode

\(X1\) = Input number 0 or 1 through 3 (0 = always output for audio assignment)
\(X2\) = Switch mode 0 = Manual (default) 1 = Auto-input switching high 2 = Auto-input switching low
\(X3\) = Status 0 = Not detected 1 = Detected
\(X1B\) = Firmware version number to second decimal place (x.xx)
\(X1P\) = Verbose mode 0 = Clear/none 1 = Verbose mode (default) 2 = Tagged responses for queries 3 = Verbose mode and tagged for queries
Product Configuration Software

This section details the Extron Product Configuration Software (PCS), available on the Extron website. The Windows-based PCS communicates with the switcher via the front panel configuration port, a standard USB mini-B port (see item A on page 12).

Installing the Software

PCS and Firmware Loader are available on the Extron website. Download and install both programs as follows:

NOTES:

• This procedural description is illustrated as using Internet Explorer. Depending on the browser you use, some steps or indications may be different.
• Steps 1 through 7, below, are also used to download firmware update packages.

1. Go to www.extron.com and click the Download tab (see figure 12, 1).

2. Click the Software or Firmware link as appropriate to the operation you are performing (2).

3. Click Download for the desired software or firmware to download (3).

TIP: Jump to the nearest page of downloads by clicking the desired filtering letter (4).

The Log in dialog box appears (see figure 13 on the next page).
4. Enter the **E-Mail address** and **Password** associated with your Extron website account (see figure 13, ①).

**TIPS:**
- Contact the Extron S3 Sales & Technical Support Hotline to obtain website credentials.
- Click **Keep me logged in** (②) to eliminate steps 4 and 5 in future downloads.

5. Click **Log in** to copy the software to the computer (③).

6. If your browser asks you to confirm that you want to continue, click **Run** or make a similar confirmation (see figure 14, ①).

**Figure 14.** Download Warning and Confirmation

**NOTE:** Figure 14 may appear different or may not appear at all, depending on your Web browser choice and its security settings.

7. Click **Run** to confirm that you want to run the installation (①).

8. **For a firmware download**, exit this procedure and go to **Updating the Firmware** on page 26.
9. Follow the on-screen instructions. The installation creates the necessary subfolders of C:\Program Files and the necessary groups. It places the appropriate files into the correct group folders:

**NOTE:** C:\Program Files(x86)\ ... for 64-bit Windows OS.

**Product Configuration Software** —

**NOTE:** These are default directory paths. Users can choose the directory path they want.

- **Folder** — C:\Program Files\Extron\Extron PCS
- **Group folder** — Extron Electronics\Extron Product Configuration Software
  - Check for Extron PCS Updates
  - Extron PCS Help
  - Extron Product Configuration Software
  - Uninstall Extron Product Configuration Software

**Firmware Loader** —

- **Folder** — C:\Program Files\Extron\FWLoader
- **Group folder** — Extron Electronics\Firmware Loader
  - Check for Firmware Loader Updates
  - Firmware Loader Help
  - Firmware Loader
  - Uninstall Firmware Loader

**Starting the Program**

Start the Extron Product Configuration Software as follows:

1. Click Start > Programs > Extron Electronics > Extron Product Configuration Software > Extron Product Configuration Software.

The Product Configuration Software opens to the Device Discovery screen (see figure 15).

**Figure 15. Device Discovery Screen**

2. Select (click) your DTP T USW 233 unit (see figure 15, 1).
3. Click **Connect** (see figure 15, ②, on the previous page). The Product Configuration Software opens to the **Input/Output Configuration** page (see figure 16).

Operate the Product Configuration Software as described in the PCS Help (click > Extron PCS Help).

![Figure 16. Product Configuration Software](image)

**Updating the Firmware**

The Product Configuration Software can call the Firmware Loader utility, which provides a way to replace the firmware that is coded on the control board of the switcher without taking the unit out of service.

**NOTE:** Upgrading the firmware does not overwrite the current configuration.

Update the unit firmware as follows:

1. Perform steps 1 through 6 of **Installing the Software**, starting on page 23, to download the firmware upgrade from the Extron **website**.

2. Click **Run** in the **File Download and Security Warning** dialog boxes (see figure 17, ② on the next page). The PC downloads the firmware update from the Extron website and starts the Extron Installation Program to extract the firmware file.
Figure 17. Extracting Firmware Upgrade Files
3. Click **Next** (see **figure 17**, 3 on the previous page). The program extracts the firmware files and places them in a folder identified in the **InstallShield Wizard** window.

**ATTENTION:**
- The extension of the firmware file must be .s19. Opening a file with an incorrect extension may cause the device to stop functioning.
- L’extension du fichier firmware doit être .s19. Si un fichier est ouvert avec une mauvaise extension, l’appareil peut arrêter de fonctionner.

**NOTES:**
- **Note the folder to which the firmware file is saved.** When downloaded from the Extron website, the firmware is placed in a subfolder of:
  - **64-bit Windows OS:** C:\Program Files (x86)\Extron\Firmware.
  - **32-bit Windows OS:** C:\Program Files\Extron\Firmware.
- The original factory-installed firmware is permanently available on the unit. If the attempted firmware upload fails, the unit reverts to the factory-installed firmware.

4. Click **Finish** to exit the program (4).
5. Connect the computer to the rear panel Remote RS-232 port (see **item A** on page 7) or front panel Configuration (USB) port (see **item A** on page 12) of the switcher.
6. Start the Product Configuration Software and connect to the unit (see **Starting the Program**, beginning on page 25).
7. Click **Device Menu > Update firmware**. The software asks you to confirm that you want to continue the update (see **figure 18** on the next page).
Figure 18. Updating Firmware

8. Click **Continue** (see figure 17, 1). The Product Configuration Software disconnects itself from the unit and calls the Firmware Loader utility in the background. The **Update Firmware** dialog box appears.

9. Click **Browse** (2). The **Open** dialog box opens.

10. Navigate to the folder where you saved the firmware upgrade file. Select the file (3) and click **Open** (4). The **Update Firmware** dialog box returns to the top.

11. Click **Update** to continue (5).

The Firmware Loader utility tests the connection, installs the update, and then verifies the firmware.

At the conclusion of the process, the utility reports **Upload Complete**.
12. Click **Close**. The Product Configuration Software window returns to the front.

13. Click the ![icon](image) in the connection tab to completely disconnect the program from the unit and then reconnect the program as described in **Starting the Program**, on page 25.
This section provides procedures for mounting the DTP T USW 233 switching transmitter and disconnecting the ground between it and a compatible receiver.

- **Mounting the Switcher**
- **Disconnecting the Ground**

**Mounting the Switcher**

**ATTENTION:**
- Installation and service must be performed by authorized personnel only.
- Avoid ground potential differences between the switching transmitter and receiver installation sites, which can lead to **equipment damage** or a missing or unstable picture. If a potential difference cannot be avoided, remove the ground connection between the units and locally power both units (see **Disconnecting the Ground** on page 32).
- L’installation et l’entretien doivent être effectués par le personnel autorisé uniquement.
- Évitez les différences de potentiel de mise à la terre entre les sites d’installation de commutation émetteur-récepteur, qui pourraient endommager l’équipement ou rendre l’image invisible ou instable. Si une différence de potentiel ne peut être évitée, enlevez la connexion de mise à la terre entre les unités et alimentez les deux unités localement (voir **Disconnecting the Ground** à la terre page 32).

The 1-inch high, half rack width DTP T USW 233 switching transmitter can be placed on a table, mounted in a rack, or mounted under a desk or table.

**Tabletop Use**

Affix the included rubber feet to the bottom of the unit and place it in any convenient location.

**Mounting kits**

Mount the unit using any optional compatible mounting kit listed on the Extron website (**www.extron.com**), in accordance with the directions included with the kit. For rack mounting, see **UL Rack-Mounting Guidelines** on the next page.
UL Rack-Mounting Guidelines

The following Underwriters Laboratories (UL) requirements pertain to the installation of the unit into a rack.

- **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (TMA = +122 °F, +50 °C) specified by Extron.

- **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

- **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

- **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as use of power strips).

Disconnecting the Ground

If you cannot resolve a ground potential difference between the switching transmitter and receiver installation sites (as suggested by a missing or unstable picture), remove the ground connection between the units as follows:

**NOTE:** Once you have removed the ground jumpers, the DTP T USW 233 cannot extend analog audio and one unit cannot remotely power the other. No analog audio is output and the paired receiver requires its own dedicated power supply.

1. Disconnect any cables and remove the switching transmitter from any rack or other installation option.

2. Remove and retain the screws (nine screws, three on each side and three on top) securing the cover to the switching transmitter. Slide the cover forward slightly and lift it off the unit (see figure 19).

   **TIP:** Be careful not to bend the electrical contact “legs” of the button and LED assemblies on the circuit board. If the buttons or LEDs are misaligned with the holes in the cover, it may be difficult to reassemble the switcher.

3. Locate and lift off jumpers JMP1 and JMP2 (see figure 20 on the next page).
4. Reinstall the switcher cover, securing it in place with the screws removed in step 2.
5. Reinstall the switcher in the rack or other installation option (see Mounting the Switcher on page 31).
6. If you are using shielded cable, disconnect the cable shield from the connector at either end of the cable.
7. See the manual for the applicable receiver available at www.extron.com, and remove the ground jumpers in the receiver.
8. Obtain a second 12 V power supply (one supply is provided with the switching transmitter and normally powers both units), and locally power both units (see Power supply wiring on page 10).

ATTENTION:

- This product is intended to be supplied by a UL Listed power source marked “Class 2” or “LPS,” rated 12 VDC, 1.0 A minimum. Always use a power supply supplied by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Ce produit est destiné à une utilisation avec une source d’alimentation listée UL avec l’appellation « Classe 2 » ou « LPS » et normée 12 Vcc, 1,0 A minimum. Utilisez toujours une source d’alimentation fournie ou recommandée par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute conformité réglementaire et peut endommager la source d'alimentation ainsi que le produit final.
Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America, and Central America:**
Extron Electronics  
1230 South Lewis Street  
Anaheim, CA 92805  
U.S.A.

**Europe and Africa:**
Extron Europe  
Hanzeboulevard 10  
3825 PH Amersfoort  
The Netherlands

**Asia:**
Extron Asia Pte Ltd  
135 Joo Seng Road, #04-01  
PM Industrial Bldg.  
Singapore 368363  
Singapore

**Japan:**
Extron Electronics, Japan  
Kyodo Building, 16 Ichibancho  
Chiyoda-ku, Tokyo 102-0082  
Japan

**China:**
Extron China  
686 Ronghua Road  
Songjiang District  
Shanghai 201611  
China

**Middle East:**
Extron Middle East  
Dubai Airport Free Zone  
F13, PO Box 293666  
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

**NOTE:** If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

<table>
<thead>
<tr>
<th>Region</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>714.491.1500 or 800.633.9876</td>
</tr>
<tr>
<td>Asia</td>
<td>65.6383.4400</td>
</tr>
<tr>
<td>Europe</td>
<td>31.33.453.4040</td>
</tr>
<tr>
<td>Japan</td>
<td>81.3.3511.7655</td>
</tr>
</tbody>
</table>

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.